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Medicinal Potential of Ocimum Gratissimum (Scent Leaf) and Vernonia Amygdalina Del (Bitter Leaf)

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Abstract:
Fruits and vegetables are a great source of phytochemicals that play protective roles in many diseases. A comparative phytochemical composition of Ocimum Gratissimum L. (Scent leaf) and Vernonia Amygdalina Del (Bitter leaf) was carried out. The plant samples were washed thoroughly and sun dried till no moisture was felt and then each sample was blended into fine powder and stored in air tight container for analysis. The blended sample was placed in a soxhlet extractor. This was done differently for each of the test samples, using a thimble. The extraction was done using 250ml of ethanol for about four hours. After the extraction, the solvent used (ethanol) was recovered from the crude extract and the extract concentrated by distillation. Quantitative determination of flavonoid was done according to the method described by Harbone (1973). Saponin content of the sample was determined by double solvent extraction gravimetric method as described by Harbone (1973). The quantitative determination of alkaloid was carried out by alkaline precipitation, through gravimetric method described by Harbone (1973). Phenol content of sample was determined by the method described by Pearson (1976). The fallins-Denis spectrophotometric method as described by Harbone (1973) was used for the determination of tannin. The study revealed that Veronia Amygdalina yielded higher alkaloid, flavonoid and saponin (22.5%, 12% and 7.85% respectively) than Ocimum Gratissimum which yielded (alkaloid 7.5%, flavonoid 10%, and saponin 4.05%). On the contrary Ocimum Gratissimum had a higher yield of tannin and phenol (0.514% and 0.445% respectively) against Vernonia Amygdalina tannin 0.4145 and phenol 0.400%. These values showed that Ocimum Gratissimum protects more against bacterial, fungal and microbial infections compared to vernonia Amygdalina. Similarly, vernonia Amygdalina contains more antioxidant and hypolipidemic\hypocholesterolemic properties, than Ocimum Gratissimum hence could prevent diseases caused by oxidative stress, inhibit heart attack, cancerous cell growth and proliferation and is not likely to contribute to any disease associated with hyperlipidemia compared to Ocimum Gratissimum.

Keywords: *Ocium Gratissimum, Vernonia amygdalina, phytochemical and hyperlipidemia*

1. Introduction

The rationale for studying plants as traditional medicine is that 80% of 5,200 million people live in less developed countries. According to Klink (1997), W.H.O. estimates that 80% of these people rely almost exclusively on traditional medicine for their primary health care needs. Since medicinal plants are the 'backbone' of traditional medicine, it means that more than 3,300 million utilize medicinal plants on a regular basis. It cannot be denied that higher plants have yielded many useful drugs to alleviate the medical problems facing the world's population (16). Azadirachta indica is used against jaundice and various skin diseases (5). Frankincence (Boswellia sacra l.) and myrrh (commiphora myrrha l.) are employed as mouth washes due to their reported antiseptic properties (6). Today, some 1,500 species of medicinal and aromatic plants are widely used in Nigeria, Croatia, France, Germany, Hungary, Turkey and the United Kingdom (16). Ocinum Gratissimum (scent leaf) and Vernonia Amygdalina (bitter leaf) are leafy vegetables consumed in Nigeria and many West African countries (4). Scent leaf (Ocinum Gratissimum) is a shrub of about 50-80cm tall with ovate serrate leaves opposite in arrangement with flowers. It belongs to the family lamiaceae, its English name is tea bush, its common name scent leaf and its native Nigerian name is Nchuanwu in Igbo, Efirinrin in Yoruba and Aaidoyatagida in Hausa (22). Bitter leaf (Vernonia Amygdalina Del) is a small shrub with a silvery stem and leaves with a characteristic bitter taste, inflorescence is a capitulum producing dirty white flowers. It is vegetatively propagated by stem cutting. It belongs to the Genus, Valerianella and the family, Asteraceae. Its native Nigerian name is Onugbu in Igbo, and Ewuro in Yoruba. (22). Leafy vegetables are high in water content, low in carbohydrate and protein, moderately high in some vitamins and minerals and are excellent sources of vitamins A and C, calcium, iron, phosphorus and potassium (4). Apart from their food qualities,

vegetables have been found to contain phytochemicals with demonstrated activities which makes them very useful in chemoprevention management, treatment and control of diverse diseases (29). Vegetables provide some measure of protection against cancer cells and cardiovascular diseases, which are attributed to the presence of phytochemicals in plants (23). The chemical content of plants qualifies them for use in the pharmaceutical industries. Ocimum Gratissimum and vernonia Amygdalina Del are two of such plants (22). Therefore, there is a need to evaluate the local herbs for nutrient and chemical composition so as to determine their potential as indigenous sources of medicine (28). In this present study, a comparative phytochemical composition of Ocimum Gratissimum L. (scent leaf) and vernonia Amygdalina Del (Bitter leaf) was investigated. The study revealed that Ocimum Gratissimum and vernonia Amygdalina leaves are very rich in phytochemicals such as alkaloid, flavonoid, phenol, saponin and tannin. Veronia Amygdalina yielded higher alkaloid, flavonoid and saponin (22.5%, 12% and 7.85% respectively) than Ocimum Gratissimum which yielded (alkaloid 7.5%, flavonoid 10%, and saponin 4.05%). On the contrary Ocimum Gratissimum had a higher yield of tannin and phenol (0.514% and 0.445% respectively) against Vernonia Amygdalina tannin 0.4145 and phenol 0.400%. These values showed that Ocimum Gratissimum protects more against bacterial, fungal and microbial infections compared to vernonia Amygdalina. Similarly, vernonia Amygdalina contains more antioxidant and hypolipidemic\hypocholesterolemic properties, than Ocimum Gratissimum hence could prevent diseases caused by oxidative stress, inhibit heart attack, cancerous cell growth and proliferation and is not likely to contribute to any disease associated with hyperlipidemia compared to Ocimum Gratissimum.

2. Materials and Method

2.1. Sources of Materials

The test samples Ocimum Gratissimum and vernonia Amygdalina leaves were obtained from a farm land in Nanka, Orumba North local government area of Anambra state and their botanical identities were authenticated by Mr. M.C. Omenka, the deputy rector (academics), federal polytechnic Nekede, Imo state.

- Reagents: All reagents used were got from Rovet scientific limited, Benin City, Edo state and were of analytical grades.
- Preparation of Samples: The plant samples were examined for insect infection, washed thoroughly and sun dried. The drying process was done till no moisture was felt and then each sample was blended into fine powder and stored in air tight container for analysis.
- Preparation of Aqueous Extract: The blended sample was placed in a soxhlet extractor. This was done differently for each of the test samples, using a thimble. The extraction was done using 250ml of ethanol for about four hours. After the extraction, the solvent used (ethanol) was recovered from the crude extract and the extract concentrated by distillation.

2.2. Phytochemical Screening (Qualitative Analysis)

- Test for Tannin: The ferric chloride test described by Harbone (1973) was employed.
- Test for Saponin: The presence of saponin in the test samples was determined by the froth test as well as the emulsion test described by Harbone (1973).
- Test for Flavonoid: The presence of flavonoid in the test samples was determined by the acid alkaline test described by Harbone (1973).
- Test for Alkaloid and Phenol: The presence of alkaloid and phenol in the test samples were determined using the test described by Harbome (1973).
- Test for Cardiac Glycosides: Salkowski test was used to test for cardiac glycosides.

2.3. Quantitative Analysis

Quantitative determination of flavonoid was done according to the method described by Harbone (1973).

Saponin content of the sample was determined by double solvent extraction gravimetric method as described by Harbone (1973).

The quantitative determination of alkaloid was carried out by alkaline precipitation, through gravimetric method described by Harbone (1973).

Phenol content of sample was determined by the method described by Pearson (1976). The fallins-Denis spectrophotometric method as described by Harbone (1973) was used for the determination of tannin.

3. Results

The results of the analysis are as presented in tables 1 and 2. Table 1 shows the results of the phytochemical analysis of Ocimum Gratissimum and vernonia Amygdalina leaves and table 2 shows the result of the quantitative phytochemical composition of Ocimum Gratissimum and vernonia Amygdalina leaves. Results showed that plant materials (Natural products) generally have varied phytochemical compositions depending on the plant.

Phytochemical Test	Reagent Used	Sample A (O. Gratissimum)	Sample B (V. Amygdalina)
Alkaloid	Picric acid and iodine	+	+
Flavonoid	Concentrated ammonia and concentrated hydrochloric acid	+	+
Phenol	Ferric chloride	+	+
Saponin	Water and olive oil	+	+
Tannin	Ferric chloride	+	+
Cardiac glycoside	chloroform and sulphuric acid	+	+

Table 1: Results of the Phytochemical Analysis of Ocimum Gratissimum and Vernonia Amygdalina Leaves

Phytochemicals	Sample A (Ocimum Gratissimum)	Sample B (Vernonia Amygdalina)
Alkaloid	7.500%	22.500%
Flavonoid	10.000%	12.000%
Phenol	0.445%	0.400%
Saponin	4.050%	7.850%
Tannin	0.514%	0.414%

Table 2: Results of the Quantitative Composition of Ocimum Gratissimum and Vernonia Amygdalina Leaves

4. Discussion

In Nigeria and many West African countries, *Ocimum Gratissimum* and *vernonia Amygdalina* are found in abundance (4). They perform both medicinal and nutritive functions (29). *Vernonia amygdalina* is used in the prevention of malaria fever, elimination of worms, treatment of stomach upset, induction of fertility in barren women and treatment of diabetes mellitus (7; 12). *Vernonia amygdalina* have been used for ingivitis and toothache due to its proven antimicrobial activity (1). It has been found to be effective as blood purifier, uterus toner and helps also to prevent atherosclerosis (20; 8). *Ocimum Gratissimum* is used in traditional medicine against gastrointestinal disorders and haemorrhoids (9). It Is also used for the treatment of headache, fever, diarrhea, pneumonia, skin diseases, cough and conjunctivitis (27).

Phytochemical analysis of *Vernonia amygdalina from* previous studies revealed the presence of flavonoids, tannins, saponins, polyphenol, alkaloids, terpenes, steroids, coumarins, phenolic acids, lignans, xanthones, anthraquinones, edotides, sequiterpene, lactones (vernodaline and vernomyelin), toxic cardenolides and HCN *(*15; 21**;**13). Also, phytochemical screening of *Ocimum Gratissimum* reveals the presence of tannins, flavonoids, alkaloids, saponins and steroids. (30). These are in agreement with results from this present study which revealed that *Ocimum Gratissimum* and *vernonia Amygdalina* leaves contain Alkaloid, Flavonoid, phenol, Saponin, Tannin, and cardiac gjycoside. These compounds are pharmacologically active phytochemicals (9) which makes them very useful in chemoprevention management, treatment and control of diverse diseases (29). This may explain why *Ocimum Gratissimum* and *vernonia Amygdalina* leaves are used in traditional medicine

Previous studies have reported the beneficial health effects of some of these phytochemicals. Flavonoid are important as antioxidants or free radical scavengers as well as quenchers of singlet oxygen (25;18; 3). Thereby helping to prevent diseases caused by oxidative stress (25; 3). Alkaloid are medicinally known as local anaesthetic (17). They possess anti inflammatory, anti-cancer, analgesics, local anaesthetic and pain relief properties (19). Saponin have been shown to have hypolipidemic\hypocholesterolemic properties (2) and anticancer properties. They are also important source of steroid hormones (18). Tannins are important for enhancing wound healing (24) and may exhibit antidiuretic properties (14). They also have antimicrobial property (18). Phenol play cancer combating roles, possesses anti inflammatory properties and also prevent heart ailments (18)

Results from this study revealed that *vernonia Amygdalina* yielded higher alkaloid, flavonoid and saponin (22.5%, 12%, and 7.85% respectively) than *Ocimum Gratissimum* which yielded alkaloid 7.5%, flavonoid 10% and saponin 4.05%. This shows that *vernonia Amygdalina* contains more anti oxidant and hypolipidemic\hypocholesterolemic properties, than *Ocimum Gratissimum* hence could prevent diseases caused by oxidative stress (25; 3), inhibit heart attack, cancerous cell growth and proliferation and is not likely to contribute to any disease associated with hyperlipidemia compared to *Ocimum Gratissimum.*

On the contrary, *Ocimum Gratissimum* had a higher yield of tannin and phenol (0.514% and 0.445% respectively) against *vernonia Amygdalina* tannin 0.414% and phenol 0.400%. These values showed that *Ocimum Gratissimum* protects more against bacterial, fungal and microbial infections compared to *vernonia Amygdalina.* However, combining both medicinal plants may likely give a wider pharmacological use of the plants.

Findings from this work showed that *vernonia Amygdalina and Ocimum Gratissimum* have great potential as indigenous sources of medicine.

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